

Abbreviations

INTRODUCTION

Abbreviations are useful in scientific writing. For example, spelling out a chemical name such as ethylenediaminetetraacetic acid at each mention in favor of the abbreviation EDTA is tiresome not only to the author but also to the reader. If not used correctly, however, abbreviations can hinder understanding. The reader, after all, should be allowed to concentrate on the subject of the paper, not on remembering a long list of abbreviations. Thus, keep the reader in mind when devising abbreviations for use in your papers and follow the rules presented here, which are designed to enhance the clarity of your writing.

We use the general term *abbreviation* to refer to acronyms, initialisms, and true abbreviations. An acronym is a shortened form composed of the initial letters or parts of a compound term and is pronounced as a word: for example, AIDS (acquired immunodeficiency syndrome) or laser (light amplification by stimulated emission of radiation). An initialism is a shortened form composed of the initial letters or parts of a compound term that is verbalized letter by letter: for example, NIH (National Institutes of Health). True abbreviations include contraction abbreviations, a shortened form of a word in which the end of the word is dropped: for example, Apr (April), and suspension abbreviations, in which the middle of the word is dropped: for example, Dr (doctor).

WHEN AND HOW TO USE ABBREVIATIONS

Do not use an abbreviation in the text if the term is used less than five times, unless the term is particularly unwieldy or is better known by its abbreviation. Do not abbreviate a single relatively short word, such as triacylglycerol. Do not use abbreviations in the title of your paper. Medical editor Edith Schwager (1) offers this advice: "if the manuscript looks as if it suffers from alphabet soup syndrome, delete all but two or three universal, traditional abbreviations and continue to spell out the rest. Brevity can spell CATASTROPHE." In other words, when in doubt, spell out.

Introduce an abbreviation the first time the term is used by adding the abbreviation in parentheses immediately after the spelled out form: High-density lipoprotein (HDL) concentrations were measured. Abbreviations can be used in the abstract, but must be redefined at first mention in the text. Accordingly, abbreviations used in the text must be redefined in tables and figures, with a few exceptions: ANOVA (analysis of variance), BMI (body mass index), HDL, LDL (low-density lipoprotein), VLDL (very-low-density lipoprotein), F (female), and M (male). Some abbreviations can be used in the text of articles without definition (**Table 1**). Note that for every journal, this

list of abbreviations that can be used without definition will be slightly different. Once you have introduced an abbreviation, use it consistently, ie, at each and every mention of the term.

The Council of Biology Editors (2) suggests that editorial offices maintain a list of abbreviations appearing frequently in their publications and specify the form of the abbreviation to be used when various forms may be correct. The *AJCN* does maintain such a list. Thus, for example, you may notice that we change DEXA to DXA (dual-energy X-ray absorptiometry), TPA to t-PA (t-plasminogen activator), MFA to MUFA (mono-unsaturated fatty acid), and i.d. to ID (inside diameter).

ARTICLES PRECEDING ABBREVIATIONS

Abbreviations should be preceded by *the* if they are pronounced letter by letter: The NIH announced new funding today. *The* can be omitted if the abbreviation is pronounced as a word: Results were analyzed with ANOVA. A similar rule is applied to determine whether *a* or *an* precedes an abbreviation. English usage expert Theodore Bernstein (3) provides the following example: "MA registers with most people as alphabetical letters, not as 'Master of Arts'; hence, 'an MA degree' is proper. On the other hand, 'NY Central' is instantly translated by the mind into 'New York Central'; it would not be read as 'En Wye Central.' Therefore, 'a NY Central spokesman' is proper."

PUNCTUATION WITH ABBREVIATIONS

Plurals of abbreviations should be formed simply by adding an *s*: Waist-to-hip ratios (WHRs) were calculated. No apostrophe should be used. Periods should not be used with abbreviations, with a few exceptions: *no.*, because otherwise the abbreviation for number could be confused with the word *no*, and *sp.* (species), because the period is required by the International

TABLE 1
Abbreviations that can be used throughout a paper without definition¹

ADP	HPLC
ATP	NS
CI	RNA
CV	SE
df	SEE
DNA	SEM
EDTA	SD
eg	vol:vol
HEPES	wt:vol
ie	

¹ Note that abbreviations for standard units of measurement can also be used without definition.

Code of Nomenclature of Bacteria (2). *AJCN* style is to also omit periods in Latin abbreviations such as *ie* and *eg*. If a comma occurs between a proper noun and an abbreviation, and the sentence continues, use a comma after the abbreviation as well: Jane Smith, PhD, presented a paper (4).

SPECIFIC EXAMPLES

United States should be written out when used as a noun, but may be abbreviated as *US* when used as an adjective. The names of other countries should not be abbreviated. The two-letter postal code abbreviations should be used for state names, *eg*, *MD* and *NY*.

Chemical names, rather than symbols, should be used in the text with the following exceptions: 1) in a list of more than five chemical elements, 2) in a complex term ($\text{Ca-Mg-SO}_3\text{-NO}_3$ solution), 3) for an element listed with a charge (Ca^{2+}), 4) for terms used in tables and equations, and 5) when accompanied by a unit (5 mg *Cu*).

When used with numeric values, units of measure should be abbreviated by using the accepted symbol for the unit as given in *Scientific Style and Format* (2) or in the standards published

by the American Society for Testing and Materials (5). Abbreviations for standard units of measure do not need to be defined.

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